Amendment to the Claims:

The listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-26. Cancelled.

27. (Currently Amended) A method for constructing a reservoir model representative of an underground reservoir, including discretizing said underground reservoir by a set of grid cells, and associating with said reservoir model a permeability field constrained by a priori geologic data and production data or pressure data obtained from well tests collected in said underground reservoir comprising:

a) constructing an initial reservoir model including generating a permeability field in accordance with a stochastic model~~,~~ coherent with the a priori geologic data;

b) identifying zones inside said underground reservoir;

c) calculating permeabilities of said zones, using a simulator to simulate fluid flows for estimating simulated production data or simulated pressure data, ~~and estimating simulated production data or simulated pressure data by carrying out, by means of a simulator, a simulation of fluid flows, to estimate~~ and estimating corrections ~~to be applied to~~ of said permeabilities ~~in order to reduce~~ for reducing a difference between said production data or pressure data obtained from well tests and said simulated production data or simulated pressure data;

d) propagating said corrections to said set of grid cells of said reservoir model~~,~~ by ~~means of~~ an iterative optimization process comprising minimizing a function which depends on said corrections, using a technique of gradual deformation of realizations of said stochastic model; and

e) using said reservoir model, including said corrections propagated to said set of grid cells, to develop said underground reservoir.

28. (Previously Presented) The method as claimed in claim 27, comprising using said reservoir model to develop an oil reservoir.

29. (Previously Presented) The method as claimed in claim 27, wherein flow simulation is carried out by means of a streamline simulator, said zones of said underground reservoir are identified by a set of grid cells traversed by one or more streamlines of fixed geometry and said zones are defined either manually or automatically from said flow simulator.

30. (Previously Presented) The method as claimed in claim 27, wherein flow simulation is carried out by means of a streamline simulator and said zones of said underground reservoir are identified by a set of grid cells traversed by one or more streamlines of fixed geometry.

31. (Previously Presented) The method as claimed in claim 27, wherein said zones are identified as volume portions on a periphery of wells running through said reservoir.

32. (Previously Presented) The method as claimed in claim 28, wherein said zones are identified as volume portions on a periphery of wells running through said reservoir.

33. (Previously Presented) The method as claimed in claim 29, wherein said zones are identified as volume portions on a periphery of wells running through said reservoir.

34. (Previously Presented) The method as claimed in claim 30, wherein said zones are identified as volume portions on a periphery of wells running through said reservoir.

35. (Previously Presented) the method as claimed in claim 27, wherein at least one gradual deformation parameter is assigned to each of said zones.

36. (Previously Presented) The method as claimed in claim 28, wherein at least one gradual deformation parameter is assigned to each of said zones.

37. (Previously Presented) The method as claimed in claim 29, wherein at least one gradual deformation parameter is assigned to each of said zones.

38. (Previously Presented) The method as claimed in claim 30, wherein at least one gradual deformation parameter is assigned to each of said zones.

39. (Previously Presented) The method as claimed in claim 31, wherein at least one gradual deformation parameter is assigned to each of said zones.

40. (Previously Presented) The method as claimed in claim 32, wherein at least one gradual deformation parameter is assigned to each of said zones.

41. (Previously Presented) The method as claimed in claim 33, wherein at least one gradual deformation parameter is assigned to each of said zones.

42. (Previously Presented) The method as claimed in claim 34, wherein at least one gradual deformation parameter is assigned to each of said zones.